

RHACOPHORUS PRASINATUS, A NEW TREE FROG FROM  
TAIWAN, CHINA (AMPHIBIA, ANURA, RHACOPHORIDAE)

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ABSTRACT. - *Rhacophorus prasinatus* n. sp. is distinguished from other green colored species of the genus *Rhacophorus* by its larger size and several other morphological characters. Its sexual dimorphism is well pronounced. Presently, the species is only known from its type locality Hou-keng-tzu situated in a small valley of Taipei Hsien in northern Taiwan, China.

#### INTRODUCTION

Only some years ago, LIANG and WANG (1978) described a new *Rhacophorus* from Taiwan found in four different localities of Taipei Hsien since 1975. They discussed the formerly mentioned occurrence of *Rhacophorus viridis* and *Rhacophorus owstoni* in Taiwan (cf. OKADA, 1966; CHEN, 1969) and concluded that these data had been based on misidentified specimens of their new species. Therefore, the recent discovery in May 1981 of still another

undescribed *Rhacophorus* in the same general area of northern Taiwan seems highly remarkable and clearly demonstrates that more research on this frog genus in Taiwan is needed.

This new frog has already been mentioned and figured in color, but not yet named, by LUE, CHEN and CHANG (1982). We herewith take the opportunity to give a more comprehensive description of the species which in allusion to its pigmentation shall be known as:

*Rhacophorus prasinatus* sp. nov.

*Rhacophorus* sp.: LUE, CHEN and CHANG, 1982, pp. 32, 68-73, 180.

*Holotype*. - NTNUB 054901, adult male, C.-H. CHANG coll., 19 October 1981.

*Type locality*. - Hou-keng-tzu, Shih-ting area, Taipei Hsien, Taiwan, 24°54' N, 121°37' E; altitude 220 m. The Hou-keng-tzu valley brook is a tributary of Pei-shih stream of Feitsui Valley.

*Paratopotypes*. - NTNUB 112801-112802, adult females, M.-C. DO, C.-S. WU, K.-Y. WANG and K.Y. LUE coll., May 1981; NTNUB 054902, adult male, K.Y. LUE coll., June 1981; NTNUB 112901, adult female, G.-W. CHENG and C.-C. YANG coll., May 1982; 3 specimens without precise data (one presented on three color pictures - jacket; pp. 68-69; p. 72 - by LUE et al. (1982); two in C.H. CHANG personal collection).

*Diagnosis*. - A *Rhacophorus* possessing the following combination of characters: large body size (larger than other members of the genus with a green colored dorsum); a distinct yellowish white strip separating the green dorsal coloration from the whitish ventral coloration (this strip is absent in the other species with the exception of *Rhacophorus chenfui*, where it is even sharper); upper side of proximal part of the fore-limb, i.e. from shoulder to elbow, of a yellowish coloration (green in the other species); supratympanic fold also of a yellowish brown coloration (this coloration is absent in *Rhacophorus taipeianus* and *Rhacophorus moltrechti*); interorbital space approximately 1,2 times the width of upper eyelid (1,5 in both *R. taipeianus* and *R. moltrechti*); tympanum diameter approximately 0,67 times the diameter of eye (0,55 in *R. taipeianus*; 0,50 in *R. moltrechti*); nostril nearer to the tip of snout than to eye.

*Description.* - Body stout; size rather large, the snout-vent length being approximately from 53 to 63 mm; skin rough with many small granules; ventral side with a few fine dark spots.

Head as long as broad, or a little longer; snout obtusely pointed; canthus rostralis distinct; loreal region slightly concave; distance from the anterior margin of the eye to the nostril equalling that from the nostril to the tip of the snout; internarial space narrower than interorbital space; tympanum clearly visible, circular, its diameter being about 0,67 times the diameter of the eye; interorbital space about 1,2 times the width of the upper eyelid; supratympanic fold (from the posterior margin of the eye over the tympanum to the shoulder) prominent; vomerine teeth in two nearly transverse series being in contact by their external sides with the upper interior margin of the choanae; tongue possessing two well developed proximal processes which are in contact at their basis thus giving the tongue an arrow-head shape (fig. 1).

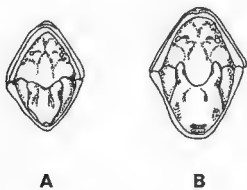


Fig. 1. - Oral cavity of male (A) and female (B) *Rhacophorus prasinatus* sp. nov.

Cavité buccale de *Rhacophorus prasinatus* sp. nov. mâle (A) et femelle (B).

Fore-limbs short and robust; flattened digits with rather large and flattened discs at their tips; webs not reaching the tips of the digits (fig. 2 A).

Hind-limbs of medium length, with flattened digits; discs of the toes smaller than those of the fingers; webs better developed, nearly

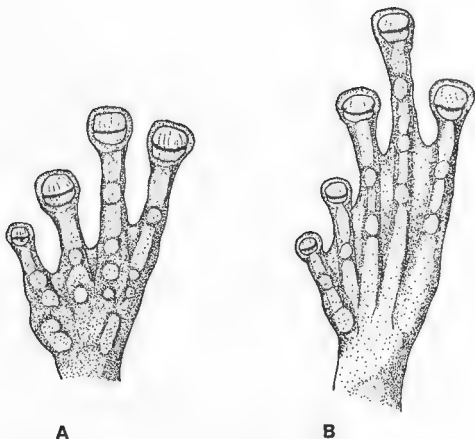


Fig. 2. - Hand (A) and foot (B) of male *Rhacophorus prasinatus* sp. nov.

Main (A) et pied (B) de *Rhacophorus* sp. nov. mâle.

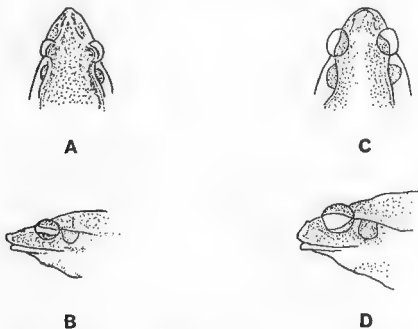


Fig. 3. - Dorsal (A,C) and lateral (B,D) view of head of male (A,B) and female (C,D) *Rhacophorus prasinatus* sp. nov.

Vue dorsale (A,C) et latérale (B,D) de la tête de *Rhacophorus prasinatus* sp. nov. mâle (A,B) et femelle (C,D).

Table I. - Measurements of five *Rhacophorus prasinatus* sp. nov. (in mm).Mensurations de cinq *Rhacophorus prasinatus* sp. nov. (en mm).

NTNUB No	054901 male (holotype)	054902 male	112801 female	112802 female	112901 female
Body Length	55.5	58.8	57.8	53.0	63.0
Head Length	20.3	21.2	20.8	20.0	23.0
Head Width	18.0	19.5	19.0	18.0	19.8
Internal Orbital Space	6.3	6.7	5.8	3.0	8.8
Hand Length	17.2	19.0	18.2	16.8	19.5
Tibia Length	24.2	25.5	28.0	25.5	29.0
Length of Foot-tarsus	36.0	37.0	38.2	36.0	41.0
Foot Length	23.8	25.5	26.0	24.2	28.0
Inner Metatarsal Tubercle	2.8	3.2	3.0	2.8	3.0
Width of Toe Pad	3.0	3.0	3.0	2.9	3.8

reaching the tips of the digits; when the hind-limbs are folded along the axis of the body, the tibiotarsal articulation reaches the middle of the orbit; a subarticular inner metatarsal tubercle is well developed (and kidney-shaped in males) (fig. 2 B); no outer metatarsal tubercle.

Sexual dimorphism well developed; snout far more pointed in males than in females (fig. 3); ventral side of females roughly granulated and covered with several irregular black dots which are absent in males; males with one vocal sac and two vocal slits and with relatively small slightly granular nuptial pads on the first two fingers.

*Coloration.* - In life: dorsum leaf green, sometimes partially with clear brownish areas or with a few small bluish spots (such spots are of a whitish

or yellowish green in *R. moltrechti*); ventral surface white with some blackish spots in some specimens (spots more pronounced in females) and becoming darker laterally (dirty white) as it comes in contact with the lateral side line marking the limit between dorsal and ventral coloration; such a yellowish line is also present at the posterior limit of the dorsum, between the coccyx and anus (like in *R. chenfu*: cf. LIU, 1950; LIU and HU, 1961); black dots on the anterior parts of the thighs; supratympanic fold, margin of upper eyelid and canthus rostralis yellowish brown; iris golden brown.

In preservative: dorsum of dark grey-blue; other parts of body white-grey.

*Measurements.* - See Table I. Measurements are taken according to LIU (1950).

#### DISCUSSION

*Relationships.* - *R. prasinatus* n. sp. closely resembles all the other green colored species of the genus. All of them being rather nondescript morphologically, the systematic position of this new species remains difficult to assess at present, and further research is needed. When describing their new species, *R. taipeianus*, LIANG and WANG (1978) assumed a close relationship of this new frog with *R. moltrechti* from Taiwan, and with *R. viridis* and *R. owstoni* from the Ryukyu Islands, but recently KURAMOTO and UTSUNOMIYA (1981) studying the call structures found out close similarities between *R. moltrechti* and *R. owstoni*, while *R. taipeianus* is quite distinct and isolated. Comparisons of the call structures among *R. taipeianus*, *R. moltrechti* and *R. prasinatus* have been made by the junior author. The preliminary data showed that the call of *R. prasinatus* resembles that of *R. moltrechti*. From a morphological point of view, there might also be affinities with the much smaller *R. chenfu* described from Omei Shan, Szechwan Province, and now also known from Hupei, Kiangsi (MA, ZONG and WU, 1982) and Fukien (TING, ZHENG and CAI, 1980) Provinces in mainland China. Unmature data obtained from Polyacrylamide Gel Electrophoresis by the junior author, using the method of NEI (1972), showed that concerning genetic identity and genetic distance, *R. prasinatus* is close to *Polypedates leucomystax*. All these informations indicate that the systematic status of *R. prasinatus* and the related biological problems should be studied more intensively.

*Habits and Habitat.* - LUE et al. (1982) have illustrated the habitat of *R. prasinatus* with a color picture. The type locality is situated in a rela-

tively isolated valley: *Citrus* is the main dominant fruit plant in the region; a small section of untouched forest still remains. *Miscanthus*, *Bambusa* and *Alocasia* are quite abundant in the place where the specimens were collected. The holotype was found on a *Hibiscus rosa-sinensis* bush growing nearby an abandoned farm house.

The mating calls were recorded from late March to October. During the breeding season, the males call on the bushes from 6 p.m. to 10 p.m.; in captivity, they even call during the daytime.

The white foamy egg mass is similar to that of *R. taipeianus* and of *R. moltrrechtii*. One foamy egg mass was found fixed on the leaves of *Hibiscus rosa-sinensis*, and another one was found close to the water surface in an abandoned bucket (cf. color picture in LUE et al., 1982, p. 14).

Other species of tree frogs (family Rhacophoridae) collected in the same region include *R. taipeianus*, *Buergeria robusta*, *Chirixalus eiffingeri* and *Polypedates leucomystax*.

*Range and Population status.* - Currently *R. prasinatus* has only been found in its type locality, where a tiny population exists. Unfortunately, this single locality is gravely endangered by a development plan aiming at the construction of a river dam. The water reservoir created by this artificial dam will radically destroy the habitat by inundation. Therefore, more field work has to be carried out urgently and a breeding group of the recently discovered, but already endangered *R. prasinatus* has to be established in captivity.

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#### ABBREVIATION

NTNUB = National Taiwan Normal University, Biology Department.

## RESUME

*Rhacophorus taipeianus*, découvert dans 4 localités différentes de Taïpei Hsien dans le Nord de Taïwan, a récemment été décrit par LIANG et WANG (1978). D'après ces auteurs, les mentions antérieures de *R. viridis* et de *R. owstoni* à Taïwan (cf. OKADA, 1966; CHEN, 1969) reposent sur des spécimens mal identifiés de *R. taipeianus*. Une nouvelle espèce du genre *Rhacophorus* vient encore d'être trouvée en mai 1981 dans la même région. Cette espèce a déjà été citée, sans être nommée scientifiquement, dans l'ouvrage en langue chinoise de LUE et al. (1982). Par allusion à sa pigmentation, elle est décrite ici sous le nom de *Rhacophorus prasinatus* n. sp.; elle se distingue des autres espèces du même genre à coloration dorsale verte par sa taille plus importante et par plusieurs autres caractères morphologiques. Son dimorphisme sexuel est accentué. Les affinités de cette nouvelle espèce avec quelques autres espèces de *Rhacophorus* sont brièvement discutées. Sa biologie reste encore mal connue: son chant a été entendu de mars à octobre entre 18 et 22 heures et sa ponte s'effectue sous forme d'un nid d'écume suspendu comparable à celui des autres espèces du genre. *Rhacophorus prasinatus* n'est connu que par une minuscule population isolée située dans la vallée d'un petit affluent de la rivière Pei-shih, à Hou-keng-tzu (la localité-type). Malheureusement, cette localité unique se trouve à proximité du site d'un barrage en voie de construction et sera sous peu noyée sous un lac de barrage artificiel. Pour cette raison, cette espèce remarquable récemment découverte mais déjà menacée d'extinction, devra être étudiée rapidement et des mesures d'urgence devront être prises pour sa sauvegarde.

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